

**WASTE PIT AREA STORMWATER RUNOFF
CONTROL REMOVAL ACTION WORK PLAN
FERNALD ENVIRONMENTAL MANAGEMENT
PROJECT JANUARY 21, 1992**

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WASTE PIT AREA STORMWATER RUNOFF CONTROL

REMOVAL ACTION

WORK PLAN

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

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for the

United States Department of Energy

Fernald Office

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1. INTRODUCTION

Operable Unit 1 includes those facilities utilized for the storage/disposal of radiological and chemical wastes from the Fernald Environmental Management Project (FEMP) operations. These facilities include Waste Pits 1, 2, 3, 4, 5, and 6; the Burn Pit; and the Clearwell. Analytical results indicate that elevated concentrations of uranium are present in the stormwater run-off from the waste pits and perimeter areas. Contaminated stormwater from the waste pit perimeter areas is currently released to the environment by draining to Paddy's Run. The Remedial Investigation/Feasibility Study (RI/FS) for Operable Unit 5, Environmental Media, will consider the effects of leakage from Paddy's Run into the regional aquifer. Because of the associated potential threat to human health and the environment, the Department of Energy (DOE) is pursuing a removal action to control the stormwater run-off from this area pending the outcome of the RI/FS and the implementation of a final remedial action for Operable Unit 1 and Operable Unit 5. The scope for this removal action can be broadly defined as management of radioactively contaminated stormwater run-off from the waste pit area. Waste storage units within the waste pit area that are included in this removal action include six waste pits, the Burn Pit, the Clearwell, and 4 concrete storage silos.

This removal action is a component of Operable Unit 1. All activities performed under this work plan will be in accordance with the NCP and consistent with the guidance of OSWER Directive 9360.0-03B, SUPERFUND REMOVAL PROCEDURES, Rev. 3. The Consent Agreement under Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 120 and 106(a) requires a work plan to be submitted for implementation of Removal Number 2, the Waste Pit Area Stormwater Run-Off Control removal action. This work plan satisfies that commitment.

An Engineering Evaluation/Cost Analysis (EE/CA), in accordance with 40 CFR 300.415, has been prepared to evaluate removal action alternatives using available data to support the selection of a preferred alternative. The National Environmental Policy Act of 1969 (NEPA) requires that federal agencies include in their decision making processes appropriate and careful consideration of all environmental effects of proposed actions. The EE/CA was prepared for the purpose of integrating the requirements of both the CERCLA and NEPA.

2. BACKGROUND

2.1 Summary of the Potential Threat

Natural drainage from the waste pit area is primarily westward toward Paddy's Run. Stormwater run-off from this area contains various concentrations of uranium.

More specifically, stormwater run-off from the majority of the soil covered surfaces of Waste Pits 1, 2, and 3 currently drains by gravity to the Clearwell. Stormwater that collects in Waste Pit 5 flows by gravity via an underground line to the Clearwell. From the Clearwell, the run-off is pumped to the Bionitrification Surge Lagoon (BSL). Stormwater that collects in Waste Pit 6 is allowed to accumulate and is periodically pumped to the BSL utilizing a portable pump and existing underground piping. Due to the evaporation rate, this is only pumped a few times per year.

The stormwater run-off from the remaining portions of the waste pit area flows to Paddy's Run. Several of these areas have been shown to produce contaminated stormwater run-off. Upon entering Paddy's Run, the potential exists for these contaminants to migrate to the Great Miami Aquifer. This aquifer is within the buried valley aquifer of the Great Miami River Basin, which has been designated as a Sole-Source Aquifer by the EPA under Section 1424(e) of the Safe Drinking Water Act. Under this designation, the Regional Administrator of Region V of the EPA has determined that this aquifer is the sole or principal source of drinking water for this area. Contamination of Paddy's Run and/or the underlying aquifer may pose potential exposure risks to public health and the environment. The areas that produce contaminated stormwater run-off are planned to be controlled by the preferred alternative which was identified in the EE/CA.

Exposure to the contaminants in the stormwater run-off can occur as a result of the release of these contaminants to Paddy's Run. The contaminants may then be discharged from Paddy's Run to the Great Miami River or the underlying sand and gravel aquifer. Paddy's Run is not used as a drinking water supply. Ingestion of sediment from the stream is considered a potential exposure pathway for children. Ingestion of groundwater from the aquifer underlying Paddy's Run is an additional potential exposure pathway. Other exposure pathways associated with the groundwater include ingestion of crops irrigated by the water, ingestion of beef from cattle exposed to uranium through water and crops, and ingestion of milk from cows exposed to uranium through water and crops.

2.2 Related Actions

Past

In 1986 a project was initiated to control the stormwater run-off from the Plant 1 storage pad area (PA 40-86602 - Surface Water Control of Plant 1 Storage Pad). Prior to the completion of this project, stormwater run-off from several portions of the Plant 1 Storage Pad flowed to Paddy's Run via drainage ditches within the Waste Pit Area. The implementation of this project redirected the stormwater flows from these portions of the Plant 1 storage pad to the site Storm Sewer System. This was accomplished by modifying a portion of the storage pad to include a curb around the periphery to keep stormwater confined to the existing pad drainage system. The drainage line from this drainage system was redirected from its previous termination point which flowed to the Waste Pit Area and directed to the Storm Sewer System. Also, northern sections of the storage pad that flowed over the grassy area to the west and then through the Waste Pit Area were redirected to the Storm Sewer System. This was accomplished by plugging the culvert that led to the Waste Pit Area and reversing the drainage ditch flow. A new storm sewer inlet was then added to accommodate these flows. This project was completed in October of 1988.

This project was related to the Waste Pit Area Stormwater Run-Off Control removal action in that it stopped the flow of contaminated stormwater run-off from the process area to the waste pit area and ultimately to Paddy's Run. The specific impact is that these actions limited the scope of this removal action to the areas surrounding the six waste pits, the Bumpit, the Clearwell, and the four concrete storage silos.

Present and Future

This removal action was originally a task in a subproject of a larger Line Item Project - "Environmental Safety and Health Improvements". This subproject entitled "Waste Water Treatment Improvements - Plant wide" includes four Tasks:

- | | |
|--------|--|
| Task 1 | Waste Pit Area Stormwater Run-Off Control |
| Task 2 | Process Area Stormwater Run-Off Control Improvements |
| Task 3 | Advanced Waste Water Treatment Facility (AWWT) |
| Task 4 | Water Recycle and Reuse. |

Task 1, Waste Pit Area Stormwater Run-Off Control, is the subject of this work plan and will be completed prior to the completion of Tasks 2 through 4. Because this ongoing project was closely related to Operable Unit 1, and would be required in some form for any final remediation activities taking place under Operable Unit 1, a decision was made to make this ongoing project a removal action. A schedule for its completion is included as Attachment I.

Tasks 2 through 4 remain ongoing projects at the FEMP, however the scopes and schedules of these line item tasks are subject to changes.

2.3 Roles of the Participants

The DOE, as the lead agency, will coordinate and execute this removal action. The U.S. EPA and the Ohio Environmental Protection Agency (OEPA) roles have been one of providing guidance and participation in the preparation of the CERCLA 120 Consent Agreement and technical information exchanges.

The U.S. EPA has reviewed and conditionally approved the EE/CA document identifying the selected removal alternative for the Waste Pit Area Stormwater Run-Off Control removal action. The U.S. EPA has approval authority for this Work Plan.

ASI, as a contractor to DOE, is conducting the RI/FS program including preparation of the South Plume removal action EE/CA and through their subcontractor, IT Corporation, providing analytical services.

WEMCO, as the FEMP Operating and Maintenance contractor, is responsible to implement this removal action in a manner consistent with DOE and regulatory guidance.

A.M. Kinney, Inc., as the design consultant, is responsible for the preparation of the design plans and specifications.

2.4 Removal Action

The preferred alternative, identified in the EE/CA, incorporates planned separation of drainage areas within the waste pit area, thus isolating contaminated from noncontaminated stormwater run-off. Contaminated stormwater will continue to be collected in the existing Clearwell; and, additional contaminated stormwater will be collected in a new collection sump and pumping station that will be located south of the Clearwell. Drainage flow control devices will be installed in upstream drainage channels, located in the waste pit storage area, to restrict peak flows to the new pumping station. The new system will pump the collected stormwater run-off to the BSL, where suspended solids would be allowed to settle prior to treatment through the biodenitrification towers and effluent water treatment system.

In a proposal dated September 28, 1990, the DOE offered to construct a 150 gpm wastewater treatment system which will treat FEMP effluent prior to being discharged to the Great Miami River. In a letter dated October 25, 1990, the U.S. EPA accepted this proposal. It was agreed that this interim treatment unit will remain in operation until the advanced wastewater treatment (AWWT) system comes on-line.

2.5 Integration with the Final Remedial Action

The Waste Pit Area Stormwater Run-Off Control removal action is consistent with all final remedial action alternatives for Operable Unit 1. The final remedial action alternatives that are being considered include the following:

- Nonremoval, Physical Stabilization, Slurry Wall and Cap
- Removal, Sludge Treatment, and On-Site Disposal
- Removal, Sludge Treatment, and Off-Site Disposal

All of these final remedial action technologies will require some degree of stormwater run-off control and will benefit from the implementation of this removal action.

The Waste Pit Area Stormwater Run-Off Control removal action will be implemented far in advance of any of the alternatives for final remediation of Operable Unit 1. Therefore, no scheduling conflicts are anticipated.

3. SUPPORT ACTIVITIES

3.1 Project Planning Activities

Activities that will be undertaken prior to the actual site work are planning, training, design, and management of the removal actions preparatory efforts. These activities are required to render the area reasonably free of hazards to personnel and/or the environment until the RI/FS process has been completed and to determine if further action is required.

The following distinct engineering phases will be performed by WEMCO to provide the necessary definition for development of accurate scope, cost, and schedule documents:

a. Project Planning

Included in this activity will be the preparation of detailed task listings and delineation of responsibilities to support the schedule given in Attachment I. Specific items will be made available to the U.S. EPA upon completion of the engineering phases of the scope of work. These items will include information regarding the discussion of a preliminary operations and maintenance manual, cost estimate, and detailed schedule indicating project planning activities.

b. Design of Removal Action

Definitive design documents will be prepared for the removal action construction work.

c. Bid and Award/Construction Management

All bid and award documents will be prepared for the removal action construction work along with the procurement of all equipment, materials and subcontractors necessary to complete the removal action construction work.

3.2 Training Requirements

All personnel involved with the implementation of this removal action will be trained in accordance with the Occupational Safety and Health Administration (OSHA) standards found in 29 CFR 1910.120, radiation worker training, and respirator training and fit testing.

4. FIELD ACTIONS

4.1 General

Construction of this project will include concrete drainage ditches, dikes, culverts, and existing topographic features to collect the waste pit perimeter area stormwater run-off. A concrete collection sump will be installed south of the existing Clearwell to collect contaminated stormwater run-off and pump to the BSL. Stormwater will flow to the sump by means of installed concrete trenches, berms, and/or ditches. The stormwater run-off from other areas of the waste pit area will be rerouted away from the contaminated waste pit perimeter drainage areas and will continue to flow by gravity to Paddy's Run. Other sources of uncontrolled stormwater leaving the FEMP site will be addressed by either Operable Unit 3 - Production Area and Additional Suspect Areas, or by Operable Unit 5 - Environmental Media. Drainage Area "A" is considered to be one such area that will need to be evaluated by one or both of these Operable Units. It is anticipated that additional sources of contaminated, uncontrolled stormwater run-off will be addressed by localized soil removal and remediation. Several drawings (C-1, C-2, and C-3) have been included from the current design package to illustrate the field actions involved in this removal action. Drawing C-2 includes a construction sequence for the major construction activities included in this removal action. The design of this project, to date, was completed by A.M. Kinney, Inc. A full set of design drawings was prepared to support the line item project, but have not been included since the level of detail exceeds that required for this Work Plan. The design package will be modified to reflect the provisions of the approved EE/CA document.

Flow control equipment will be installed to regulate the flow of run-off water to the collection sump during periods of heavy rain. Much of the area directly over the waste pits is presently collected and pumped to the BSL. The basin will contain a pump pit area equipped with a sump pump to empty the pit area for maintenance.

Four submersible 700 gpm pumps will be located at the pumping station. The system has been designed so that three of the four pumps will handle a 25-year rainfall event. The fourth pump will remain in standby, but is capable of being used in an emergency, such as if an overflow is imminent. These will pump the collected stormwater from the basin to the BSL.

A 12-inch underground force main will be installed from the pump station to the BSL. At the BSL, the force main will run aboveground over the berm of the BSL. The force main is provided with a back drain valve that will open when the pumps are shut off at low level. This will allow the main to drain back to the sump to prevent freezing and eliminate the need for heat tracing the force main.

Wetlands on the FEMP site are being delineated as part of the RI/FS. Preliminary results indicate that the impacted area is small. Implementation of this removal action will result in a short-term disturbance during construction; the area disturbed will be allowed to re-vegetate after construction and the long-term impacts will be minimal.

The implementation of this system will consist of separate types of construction activities. These activities and a brief explanation of each are detailed below and are similarly discussed in the Health and Safety Plan (Attachment III):

Installation of drainage ditches, dikes, and culverts. This portion of the removal action will involve trenching and excavation activities that will facilitate the installation of stormsewer sections, culverts, and concrete drainage ditch sections.

Installation of inlet flow control and overflow structures. This portion of the removal action will involve excavation activities to support the installation of two concrete inlet flow control structures and one overflow stand pipe.

Installation of the new collection sump and associated equipment. This portion of the removal action will involve the most extensive excavation. The excavation will be large enough to facilitate the construction of the collection sump. The approximate dimensions of the excavation for this collection sump are 60' wide x 110' long x 15' deep. This portion of the removal action will also include the installation of the pumps, piping, and instrumentation for the operation of this system. Installation of the collection sump will include relocation of a portion of the perimeter roadway. Also, installation of the trailer-mounted pilot scale treatment unit will be included in this portion. This unit shall conform to all FEMP standards, including IHS-F-06.

Installation of the underground force main. This portion of the removal action involves the installation of the underground force main piping from the collection sump and pump station to the BSL.

It should be noted that the current project design may require modification. Modification of the design may be required to ensure that a maximum permeability of 1×10^{-7} cm/sec is achieved in the two detention areas. If existing conditions do not achieve this permeability, modifications to the soils in the detention areas will be required.

Operations and Maintenance

After construction is complete and after WEMCO completes the start-up testing period, the system will be operated and maintained by

WEMCO Operations. WEMCO Operations will be responsible for the operation, monitoring and maintenance of the system. Existing WEMCO utilities operators will control this system. The Utility Engineers will be assigned as the supervisory responsible for this system and will be available on site at all times. Site Standard Operating Procedures (SOPs) will be developed and will cover the operation and maintenance of the system.

4.2 Soil Management

The analytical data from the 44 samples collected in the project work area indicate that the soils throughout the work area are substantially alike. Therefore, segregation of excavated soils from the soils adjacent to excavations is unwarranted. Furthermore, the use of soils previously removed from the excavation as backfill would not represent an increased threat to the public or environment, and would not preclude any future remedial actions as a result of the Operable Unit 1 RI/FS.

New Sump Excavation: Soil removed from the upper two feet of the sump excavation will be stockpiled as specified in the "Soil Stockpiles" section of the Sampling and Analysis Plan. Soil removed from below the upper two feet of the sump excavation shall be stockpiled separately, but as specified in the "Soil Stockpiles" section of the Sampling and Analysis Plan. Soil removed from the greater than two feet in depth in the excavation shall be used as backfill around the completed sump.

Pipeline Excavations: Spoil soils from pipeline excavations shall be piled near the excavations in a manner consistent with OSHA excavation safety regulations. The excavated soil shall be used to backfill the pipeline excavation after placement of the pipe. No excess soil will be generated during the installation of pipelines, preventing the unnecessary creation of soil piles.

Concrete Trench and Curb Excavations: Spoil soils from excavations made to install concrete trenches or curbs shall be piled near the excavation in a manner consistent with OSHA excavation safety regulations. The same soil shall be used to backfill around the concrete trenches or curbs. Excess soil shall be placed on the stockpile with soil from the upper two feet of the new sump excavation.

Both stockpiles of soil shall be sampled, analyzed and dispositioned as specified in the Sampling and Analysis Plan.

5. SAMPLING AND ANALYSIS PLAN

The stormwater runoff from portions of the Waste Pit Area has been determined to have elevated concentrations of uranium, warranting this removal action. In addition, sampling and analysis of the soils in areas that will be involved in construction activities has been performed.

Additional sampling and analysis has revealed that the maximum allowable permeability of $10E-7$ cm/sec would be exceeded by existing soils in detention areas. The construction details for two (2) drainage areas where runoff water is likely to be retained on a regular basis or runoff water flow is likely on a regular basis have been modified to reduce the permeability of the channel. Reduced permeability will be achieved in these areas by the use of channel flow line concrete paving and bentonite waterproofing techniques. Please find below descriptions of the specific permeability reducing details utilized in the two (2) affected drainage channels.

East Inlet Structure: Three (3) drainage channels upstream of the East Inlet Structure will be improved utilizing 6 inch concrete paving at the channel flow line. Three channels, one approaching from the east, one approaching from the south and one approaching from the north will receive 6 inch thick concrete paving at their flow lines placed over bentonite waterproofing mats. Bentonite waterproofing mats will also be applied to the below grade exterior surfaces of the East Inlet Structure.

North Inlet Structure: The drainage channel upstream and to the east of the North Inlet Structure will receive 6 inch thick concrete paving at its flow line placed over bentonite waterproofing mats. Bentonite waterproofing mats will also be applied to the below grade exterior surfaces of the North Inlet Structure.

6. HEALTH AND SAFETY PLAN

The work to be performed will be consistent with the Health and Safety Plan prepared for this removal action. It is provided as Attachment III of this work plan. The plan identifies, evaluates, and controls all identified safety and health hazards. In addition, it provides for emergency response for hazardous operations. The plan is consistent with 29 CFR 1910.120 and the FEMP Site Health and Safety Plan. Safety documentation will be prepared according to FEMP-2116 Topical Manual "Implementing FEMP Policies and Procedures for System Safety Analysis." FMPC-2116 has been prepared to implement DOE Order 5481.1B "Safety Analysis and Review System" and DOE/OR-901 "Guidance for Preparation of Safety Analysis Reports".

7. **QUALITY ASSURANCE**

The overall quality assurance program at the FEMP is described in the site Quality Assurance Plan, FEMP 2139. The Quality Assurance Plan is based on the criteria specified in ASME NQA-1, Federal EPA Guideline QAMS-005/80 and DOE Orders 5700.6 and 5400.1. Specific quality assurance requirements will be incorporated into written and approved procedures and into personnel training. The WEMCO Quality Department will conduct surveillance and inspections and/or audits to verify compliance throughout the execution of this removal action.

DRAWINGS

1. C-1 Key Plan
2. C-2 Location Plan
3. C-3 Site Plan

January 21, 1992

Revision 3

SAMPLING & ANALYSIS PLANFEMP Waste Pit Area Stormwater Runoff Control ProjectSampling Objectives

The four (4) objectives of this sampling plan are;

- 1) to prevent the construction of permanent structures over soil containing average concentrations of radiological contaminants in excess of NRC Branch Technical Position criteria;
- 2) to determine the proper disposition of excess soils generated during this removal action;
- 3) to determine the concentration of any HSL constituents which may exist at the base of an excavation for a permanent structure; and
- 4) to determine the concentrations of any HSL constituents in the project work area.

For the purposes of this Plan, the new sump to be constructed shall be considered the only permanent structure on this project.

HSL Sampling

Prior to the initiation of work, 44 soil samples were collected from the project work area. The samples were collected, documented, packaged, and shipped in accordance with the FEMP Remedial Investigation/Feasibility Study (RI/FS) Work Plan, Volume V, Sections 6.4, 6.8, and 7.0, dated March 1988. Soil samples were analyzed for full HSL constituents as defined in Revision 1 of the RI Work Plan Addendum, "Production and Additional Suspect Areas Work Plan," Table 3-2, Pages 3 through 6. Appendix 1 contains this table. The locations of the samples collected are shown on WEMCO drawing number 75A-5500-G-00168, Revision 0.

The following details the field sampling effort:

- Each of the 44 locations were sampled to a depth of 24 inches in 6-inch increments. Specified samples were analyzed for full HSL constituents and screened for radiological contamination.

- Field screening for radiological and volatile organic contaminants was performed at each sample interval. The samples were field screened for alpha emitters with a hand-held alpha detector, for beta/gamma emitters with a pancake GM meter, and for volatile organic compounds with an HNu photoionization detector. Radiological field screening occurred in an area where the background did not exceed 300 counts per minute beta/gamma and 5 counts per minute alpha. A radiological detection was defined as any field reading that was 15% above background. A volatile detection was any reading above background.
- The first 6-inch increment at each location was screened for Gross Alpha, Beta and Gamma, and analyzed for HSL inorganics, pesticides and PCBs. Gross Alpha, Beta and Gamma screening was performed at the FEMP site laboratory using ICP Mass Spectrometry.
- Sufficient material was archived from the 6-12, 12-18, and 18-24 inch intervals so that HSL metals analysis could be performed. No such analysis has been performed.
- The sample increment displaying the highest HNu reading from each location underwent HSL volatile and semi-volatile analysis. If no above background HNu readings were detected at a location, the 18- to 24-inch sample increment was analyzed for Volatile Organic Compounds (VOCs) and semi-VOCs.
- When sampling was completed at a location, the open borings were filled with bentonite pellets. The stakes identifying the locations were left in place.

Data from HSL analysis of the 44 pre-excavation samples shall be included in the Administrative Record file for this removal action and included in the RI/FS database for use in future cleanup actions as part of Operable Unit 1 following final definition of cleanup levels through the RI/FS process.

Excess Soil Sampling and Disposition

During excavation for the new sump and other concrete structures, excluding pipelines, soil contained in the upper two feet of excavations shall be stockpiled separately from soils contained below two feet in depth. The soils will be separated and stockpiled as specified in the "Soil Stockpiles" section of this document. Numerous sampling efforts have revealed that radiological contamination in the Waste Pit area is generally confined to the top one foot of soil. The two foot depth of demarcation was chosen as a conservative and cautious acknowledgement of this trend.

Soil shall not be placed on any one stockpile for more than 30 calendar days. After soil has been placed on one soil stockpile for 30 calendar days, additional soil to be stockpiled shall be used to create an additional stockpile which will likewise be used for 30 calendar days. At the end of each 30 day stockpile usage period, soil samples will be collected from the stockpile in a manner consistent

with the RI/FS QAPP and as supplemented by Part III of SW-846, third edition, Test Methods for Evaluating Solid Waste. The number of samples, sample locations and sample depths shall be determined using methods outlined in USEPA guidance document 230\02-89-042, "Methods for Evaluating the Attainment of Clean-up Standards, Volume 1, Soils and Solid Media," dated February 1989. Specific sample locations and sample depths shall be chosen by computer random generator. Samples collected shall be analyzed for full TCLP, and total uranium and total thorium radiological parameters at an FEMP RI/FS approved laboratory. TCLP analysis shall be completed pursuant to the method specified in 55 FR 26986. Sample analytical results shall be analyzed using Student's 'T' test with an 80% confidence level.

The management requirements for each soil stockpile shall be evaluated separately. Stockpiled soil shall be managed as follows:

- A stockpile exhibiting average concentrations of depleted uranium less than 35 pCi/g and natural thorium less than 10 pCi/g, and not regulated as RCRA hazardous waste as determined by TCLP analysis, shall be returned to an uncontrolled state and made available for unrestricted use within the FEMP Controlled Area. In order to prevent wind and runoff erosion while this soil is stockpiled, the entire stockpile shall be planted with grass or other suitable ground cover vegetation. The tarpaulins placed under the stockpile during creation of the pile shall not be removed while the stockpiled soils are being stored.
- A stockpile exhibiting concentrations of depleted uranium between 35 and 100 pCi/g or natural thorium between 10 and 50 pCi/g, but neither uranium nor thorium exceeding 100 pCi/g and 50 pCi/g, respectively, and not regulated as RCRA hazardous waste as determined by TCLP analysis, shall be incorporated into the Improved Storage of Soil and Debris Removal Action #17. Tarpaulins covering stockpiles being managed as specified in this paragraph shall be removed from the stockpile. In order to prevent wind and runoff erosion while this soil is stockpiled and awaiting further action under the aforementioned removal action, the entire stockpile shall be planted with grass or other suitable ground cover vegetation. The tarpaulins placed under the stockpile during creation of the pile shall not be removed while the stockpiled soils are being stored awaiting further action under Removal Action #17.
- A stockpile exhibiting concentrations of depleted uranium in excess of 100 pCi/g or natural thorium in excess of 50 pCi/g, but not regulated as RCRA hazardous waste as determined by TCLP analysis, shall be containerized and dispositioned as low level radioactive waste.
- A stockpile exhibiting concentrations of depleted uranium in excess of 35 pCi/g or natural thorium in excess of 10 pCi/g, and regulated as RCRA hazardous waste as determined by TCLP analysis, shall be containerized, stored, and managed as mixed waste.

Construction-Related Sampling

When the base elevations of the excavation for the new sump are reached, a ten-meter grid will be established across the excavation. Each 100-square meter area will be assigned a letter designation. Letter designations will be assigned sequentially starting with the 100-square meter area in the northwestern corner of the excavation and proceeding west to east and north to south. Eight (8) total 100-square meter areas will be established. A two-meter grid will be established in each 100-square meter area. One 0-6" core sample will be collected from each 100-square meter area at the two-meter grid point identified in Figure 1 for that specific 100-square meter area. These soil samples will receive full radiological and full HSL analysis by an FEMP RI/FS approved laboratory. Aliquots of each soil sample will receive screening for total uranium and total thorium by the FEMP site laboratory.

Construction of the concrete sump will be initiated when the average total uranium and thorium concentrations, as calculated using the analytical results from the screening analyses performed by the FEMP site laboratory, indicate concentrations below the NRC Branch Technical Position (BTP) criteria (46 FR 52061) or three feet of over-excavation has occurred. The NRC BTP is further described in the "Buildover Criteria" section of this document.

If average uranium or thorium concentrations in excess of the NRC BTP are identified at the base of the sump excavation, as calculated using the analytical results of the screening analysis performed by the FEMP site laboratory, twelve additional inches of soil shall be excavated from the sump excavation. This soil shall be stockpiled with the soil excavated from greater than two feet below original grade. After the additional twelve inches of soil is excavated, the ten and two-meter square sampling grids will be re-established across the excavation and letter designations assigned to each 100-square meter area as specified above. Grid letter designations will be assigned beginning one 100-square meter area east of the previous starting point. One 0-6" core sample will be collected from each 100-square meter area at the two-meter grid point identified in Figure 1 for that specific 100-square meter area. Aliquots of each soil sample will receive screening for total uranium and total thorium by the FEMP site laboratory. This procedure shall be repeated until the average total uranium and thorium concentrations exhibited by the soil samples receiving screening by the FEMP site laboratory are less than the NRC BTP or three (3) feet of soil has been removed from the base of the excavation. 100-square meter area letter designations will be started one area to the east of the previous starting point during each successive reiteration of this procedure. Only the 0-6" core samples collected during the final iteration of the aforementioned procedure will be analyzed by the FEMP RI/FS approved laboratory.

Upon receipt of the analytical results from the RI/FS laboratory, a complete assessment of the buildover conditions will be made and reported in a removal action completion report. The FEMP recognizes that additional cleanup actions may be required as part of Operable Unit 1 Remedial Action following final definition of cleanup levels through the RI/FS process.

Buildover Criteria

The Nuclear Regulatory Commission established soil concentrations based upon EPA criteria. Concentrations were modeled so that no member of the public would be expected to receive a radiation dose of one millirad per year to the lung or three millirads per year to the bone due to inhalation or ingestion. The waste storage area is on the FEMP reservation and there is no public contact; however, this goal would be consistent with RI/FS objectives. Soil sample analytical results will be compared to the NRC BTP concentrations which are:

Depleted uranium	35 pCi/g
Enriched uranium	30 pCi/g
Natural thorium	10 pCi/g
Natural uranium ores	10 pCi/g

Depleted uranium has been the principal form of uranium at FEMP and the goal of 35 pCi/g is expected to be appropriate. Upon receipt of complete analytical results, a complete assessment of all radionuclides present will be made.

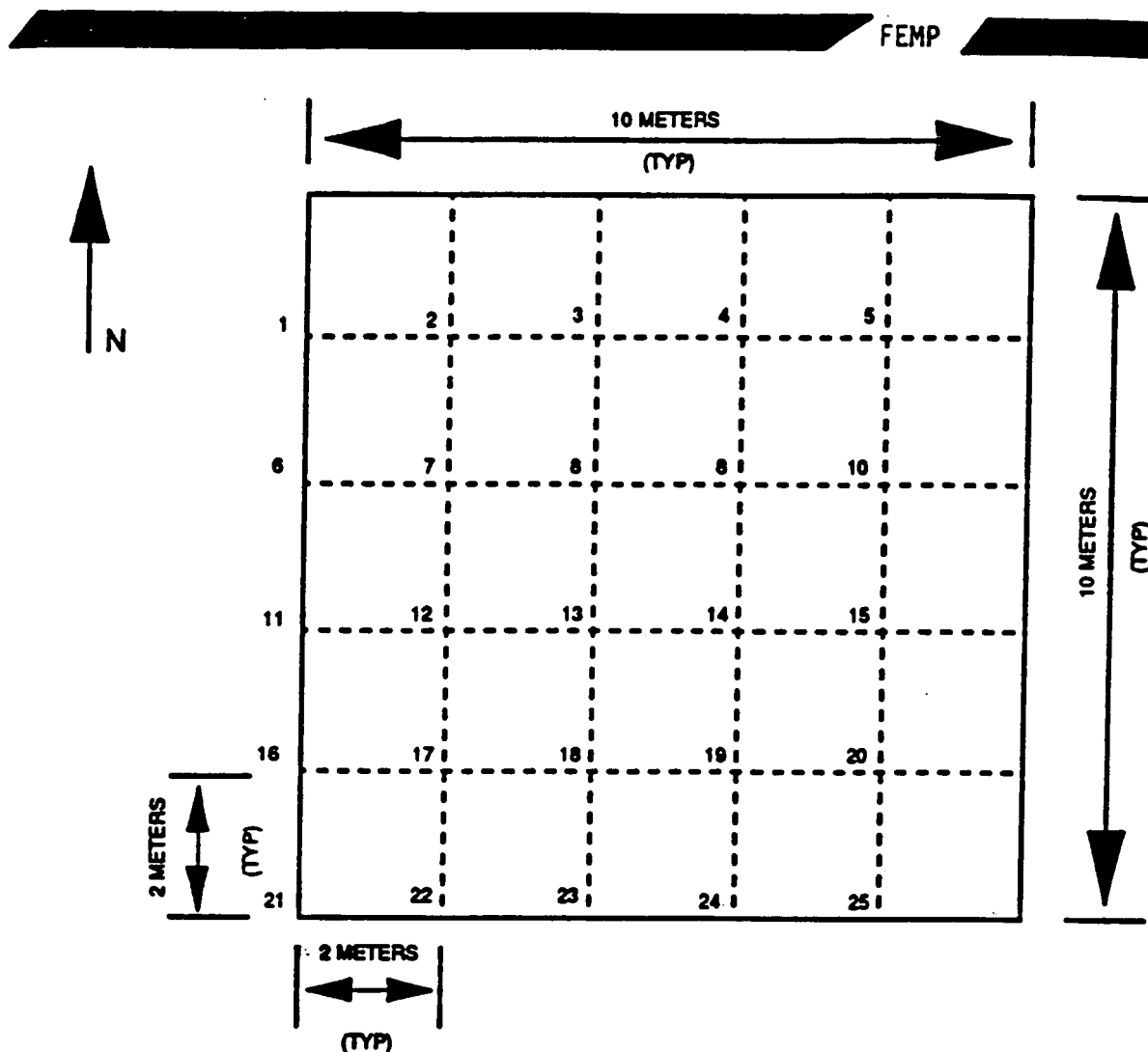
Available sampling data indicates the average isotopic ratio for the soils in the FEMP waste storage area to be in the depleted range. The 35 pCi/g criteria is considered a conservative interim cleanup level as a result of the existing institutional controls in place in the waste storage area to limit exposure to these materials.

Soil Stockpiles

Soil stockpiles shall be managed by placing a heavy tarpaulin on the ground in the area where soil is to be stockpiled. In order to allow for drainage of runoff away from the stockpile area, the site of the stockpile shall be an area slightly higher in elevation than the surrounding areas. The perimeter of the tarpaulin shall be securely fastened to the ground by stakes or other appropriate means. Soil shall be piled starting at the center of the tarpaulin and shall proceed outward. Soil shall not be placed within three feet of the edge of the tarpaulin. Each day at the completion of that days stockpiling activities and at the completion of all excavating activity, a second tarpaulin shall be placed over the stockpiled soil. The stockpiled soil shall be completely covered by the tarpaulin and the tarpaulin shall be well secured at its perimeter and intermittently over its surface area to avoid disturbance of the tarpaulin by the wind. Covering the stockpile with the tarpaulin will prevent precipitation from coming in contact with the stockpiled soil. Precipitation will fall onto the tarpaulin cover and run by gravity to the ground.

Track-mounted construction vehicles shall not be driven onto the tarpaulins. Tarpaulins shall be provided with temporary wooden access-ways for wheeled vehicles to drive onto the tarpaulin without causing tears or punctures.

After a tarpaulin is no longer required, the tarpaulin shall be dispositioned in an appropriate manner considering the types of contaminants identified within the soils stored on or under the tarpaulin in question. Soil stockpile areas will be seeded after removal of stockpiles and tarpaulins.



GRID	SAMPLE POINT	GRID	SAMPLE POINT
A	14	E	5
B	23	F	7
C	7	G	22
D	5	H	15

FIGURE 1

NOTE: THE ABOVE SAMPLE LOCATIONS WERE CHOSEN BASED UPON COMPUTER GENERATED RANDOM NUMBERS RANGING FROM 1 TO 25.

TABLE 3-2

ANALYTICAL PARAMETERS

2760

ANALC'L GROUP	ANALYTICAL PARAMETERS	VOLUME, CONTAINER	PRESERVATION
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WATER	HSL <ul style="list-style-type: none"> • HSL Organics <ul style="list-style-type: none"> - Volatiles 2-40 ml vial (with teflon septum cap) • Semivolatiles 4 liter, amber glass (with teflon-lined cap) • HSL Inorganics <ul style="list-style-type: none"> - Metals 2-1 liter, plastic (plus Molybdenm) - Mercury 500 ml, glass - Cyanide 1 liter, plastic 		Cool 4° C Cool 4° C HNO ₃ , pH<2 filtered HNO ₃ , pH<2 Cool 4° C NaOH, pH>12
	Full HSL is the above and: <ul style="list-style-type: none"> • HSL Pesti- cides/PCB 4 liter, amber glass (with teflon-lined cap) 		Cool 4° C None
	HSL+ is all the above and: <ul style="list-style-type: none"> • Organophosphorus Pesticides • Dioxin, Furans 		
SOIL	Same as for Water	500 ml, glass wide-mouth jar with teflon lid liner	None
WATER	Full Radiological <ul style="list-style-type: none"> • Total Uranium 4 liter plastic • Isotopic Uranium • Isotopic Plutonium • Radium-226 • Radium-228 • Neptunium-237 • Total Thorium • Isotopic Thorium • Technetium-99 • Cesium-137 • Strontium-90 • Ruthenium-106 		HNO ₃ , pH<2
SOIL	Same as Water	500 ml, glass or plastic container	None